

What is claimed is:

1. A laser measurement apparatus comprising:
 - a plurality of laser beam generating means for outputting laser beams having different characteristics;
 - a plurality of optical signal processing means disposed so as to correspond to each of the laser beams for detecting the corresponding laser beam and carrying out a predetermined process; and
 - an optical path means for guiding the laser beams output from the plurality of laser beam generating means via a common optical path to an object and for guiding the laser beams returning from the object via the common optical path to the optical signal processing means.
2. The laser measurement apparatus according to claim 1, wherein
 - the optical path means includes an optical guiding means; and
 - the laser measurement apparatus further comprises a control means for controlling the optical guiding means so as to guide the laser beams output from the plurality of laser beam generating means toward the object and to guide the laser beams returning from the object toward the plurality of optical signal processing means.
3. The laser measurement apparatus according to claim 2, wherein
 - the optical guiding means is a reflecting mirror; and
 - the control means controls the reflecting mirror to reflect the laser beams output from the plurality of laser beam generating means toward the object and to reflect the laser beams returning from the object back toward the plurality of optical signal processing means.

4. The laser measurement apparatus according to claim 3, wherein

one of the plurality of laser beams having different characteristics is a laser beam used for tracking, and the optical signal processing means corresponding to this laser beam comprises an optical position sensing device; and

the control means controls the direction of the reflecting mirror so that the laser beams output from the plurality of laser beam generating means are reflected toward the object based on signals output from the optical position sensing device.

5. The laser measurement apparatus according to claim 1, wherein

the plurality of laser beams having different characteristics include plural laser beams for measuring distances according to different measurement scales, and the optical signal processing means corresponding to each of the laser beams have photodetectors that detect the presence or absence of a beam that of a predetermined level and above, and outputs a signal corresponding to the presence or absence of such beam; and

the control means computes a distance between the object and a reference position based on the output signals from each of the photodetectors.

6. The laser measurement apparatus according to claim 2, wherein

the plurality of laser beams having different characteristics include plural laser beams for measuring distances according to different measurement scales, and the optical signal processing means corresponding to each of the laser beams have photodetectors that detect the presence or

absence of a beam that of a predetermined level and above, and outputs a signal corresponding to the presence or absence of such beam; and

the control means computes a distance between the object and a reference position based on the output signals from each of the photodetectors.

7. The laser measurement apparatus according to claim 3, wherein

the plurality of laser beams having different characteristics include plural laser beams for measuring distances according to different measurement scales, and the optical signal processing means corresponding to each of the laser beams have photodetectors that detect the presence or absence of a beam that of a predetermined level and above, and outputs a signal corresponding to the presence or absence of such beam; and

the control means computes a distance between the object and a reference position based on the output signals from each of the photodetectors.

8. The laser measurement apparatus according to claim 4, wherein

the plurality of laser beams having different characteristics include plural laser beams for measuring distances according to different measurement scales, and the optical signal processing means corresponding to each of the laser beams have photodetectors that detect the presence or absence of a beam that of a predetermined level and above, and outputs a signal corresponding to the presence or absence of such beam; and

the control means computes a distance between the object and a reference position based on the output signals from each of the photodetectors.

9. The laser measurement apparatus according to claim 1, wherein the optical path means includes an optical fiber cable.

10. The laser measurement apparatus according to claim 2, wherein the optical path means includes an optical fiber cable.

11. The laser measurement apparatus according to claim 3, wherein the optical path means includes an optical fiber cable.

12. The laser measurement apparatus according to claim 4, wherein the optical path means includes an optical fiber cable.

13. The laser measurement apparatus according to claim 5, wherein the optical path means includes an optical fiber cable.